

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This report has analyzed the effects that the new emission standards (LEV, HDDVNO_x, Tier2/Sulfur and HDDV/Sulfur) and DVMT growth will have on the emissions of VOCs and NO_x based on the MOBILE6 model. The study was conducted for the State of Tennessee's Department of Transportation. Emission estimations were made separately for all 95 counties in Tennessee. Example trends have been illustrated by analyzing one county from each area subgroup (Shelby, Knox, Davidson, Hamilton and Sullivan County). The following conclusions were reached in this study:

- Analysis of VMT data for the period 1990 – 1999 for all counties in the State of Tennessee have shown a wide variation in the DVMT growth rate. The linear rate at which the DVMT increased varied from about 6000 miles/day to as high as 828,000 miles/day, depending on the county.
- The new LEV, HDDVNO_x, Tier2/Sulfur and HDDV/Sulfur standards, which will be fully in-place by 2001, 2004, 2009, and 2007, respectively, will significantly reduce the emissions of NO_x and VOCs from on-road vehicles. The implementation of the new regulations will have less effect on VOC emissions compared to NO_x emissions.
- While the magnitude of the emission levels of each county vary considerably due to the different levels of DVMT that occur in each area, the general trends (relative changes in emission levels in future years compared to the baseline year 1999) for both NO_x and VOC emissions were found to be very similar.

- NO_x emissions are projected to reach a minimum in approximately 2030 statewide, whereas VOC emissions are expected to reach a minimum by approximately 2020-2025.
- There is a potential for I/M programs to further reduce mobile source emissions of specific counties. There is a 80% reduction in NO_x emissions and a 61% reduction in VOC emissions without an I/M program compared to a reduction of 87% in NO_x emissions and 70% reduction in VOC emissions with an I/M program by year 2025. On the other hand, the year to year projected emission reduction associated with I/M programs compared to the emissions without an I/M program is 2% to 42% for NO_x emissions and 21% to 39% projected reduction for VOC emissions for 1999 and 2030, respectively.

The emission projections contained in this study can be used for further and future analysis. With respect to transportation conformity, these emission projections can be used as a guidance to aid in establishing emission budgets with respect to the new 8-hour ozone standard. The study also shows the effect of an I/M program on the NO_x and VOC emissions. These results can be used as a decision tool for determining whether there is a need for a statewide I/M program versus county specific I/M programs. With the potential of increasing NO_x and VOC emissions in the future due to increasing growth of DVMT, there is also a continuing need to develop strategies which will decrease the growth rate of DVMT, improve emission control technologies, and/or utilize alternative lesser polluting vehicles in order to maintain the lower emissions which are projected to be achieved during the next 10 to 15 years.

The results presented in this study assume a constant linear increase in VMT over the next 30 years. This growth rate in VMT may not continue at the current rates especially if population and the economy do not continue to grow. Future fuel price increases could also significantly affect the VMT growth rate. If VMT growth is reduced, and/or vehicles are utilized which have even less emissions than currently required, then NO_x and VOC emissions may continue to decline beyond 2020.